Flagstaff Watershed Protection Project
Proposed Action
April 2013

Introduction

The Flagstaff Ranger District of the Coconino National Forest is preparing an Environmental Impact Statement (EIS) to document the potential effects of the Flagstaff Watershed Protection Project (FWPP). The analysis will evaluate and disclose the effects of using mechanical thinning and prescribed burning on the National Forest to reduce the threat of high severity wildfire and subsequent flooding in two key areas near the City of Flagstaff, Arizona: the Dry Lake Hills portion of the Rio de Flag Watershed north of Flagstaff, and the Mormon Mountain portion of the Upper Lake Mary Watershed south of Flagstaff (Figure 1). The City of Flagstaff is a Cooperating Agency for this project, and is participating in the planning and analysis process.

The FWPP project area includes approximately 10,543 acres (roughly 7,569 acres in the Dry Lake Hills portion and 2,974 on Mormon Mountain). Treatments would include thinning and prescribed fire. The EIS will analyze a variety of harvesting and fuel reduction methods, including the use of traditional ground-based equipment, hand thinning, and methods atypical for the region, including use of forwarders capable of operating on steep slopes as well as cable and helicopter yarding systems, in order to treat steep, inaccessible terrain (see the Proposed Action section and Table 4 of this document for more information). Vegetation may also be treated in place without being removed from the site by mechanically cutting and piling. Initial treatment implementation would be anticipated to last several years, with re-entry for maintenance burning as needed to maintain desired vegetation levels.

Background

The City of Flagstaff has seen first-hand the devastating impacts of fire and post-fire flooding following the 2010 Schultz Fire on the east side of the San Francisco Peaks. The cost of fire suppression was approximately $10 million; however, the actual cost of the fire is many times greater than that figure. Many of those additional costs have been associated with severe, repeated flooding following the fire, with flows originating on the National Forest and traveling into semi-rural residential areas just outside the city limits. Almost three years after the actual wildfire, the Forest Service and Coconino County continue to work on mitigating the threat of flooding in those areas.

The Forest Service and the City of Flagstaff are working together to reduce similar threats on National Forest System lands in the Dry Lake Hills area (Rio de Flag Watershed) north of Flagstaff and on Mormon Mountain (Upper Lake Mary Watershed) south of town, which is in a critical municipal watershed (Figure 1). Projections show that there could be severe flooding in parts of Flagstaff if a high-intensity fire were to occur on the slopes of the Dry Lake Hills, and that the Lake Mary Reservoir, which provides roughly 50 percent of the City's drinking water, could become non-functional as a water supply due to sediment and carbon influx following a severe wildfire. During the November 2012 elections, residents

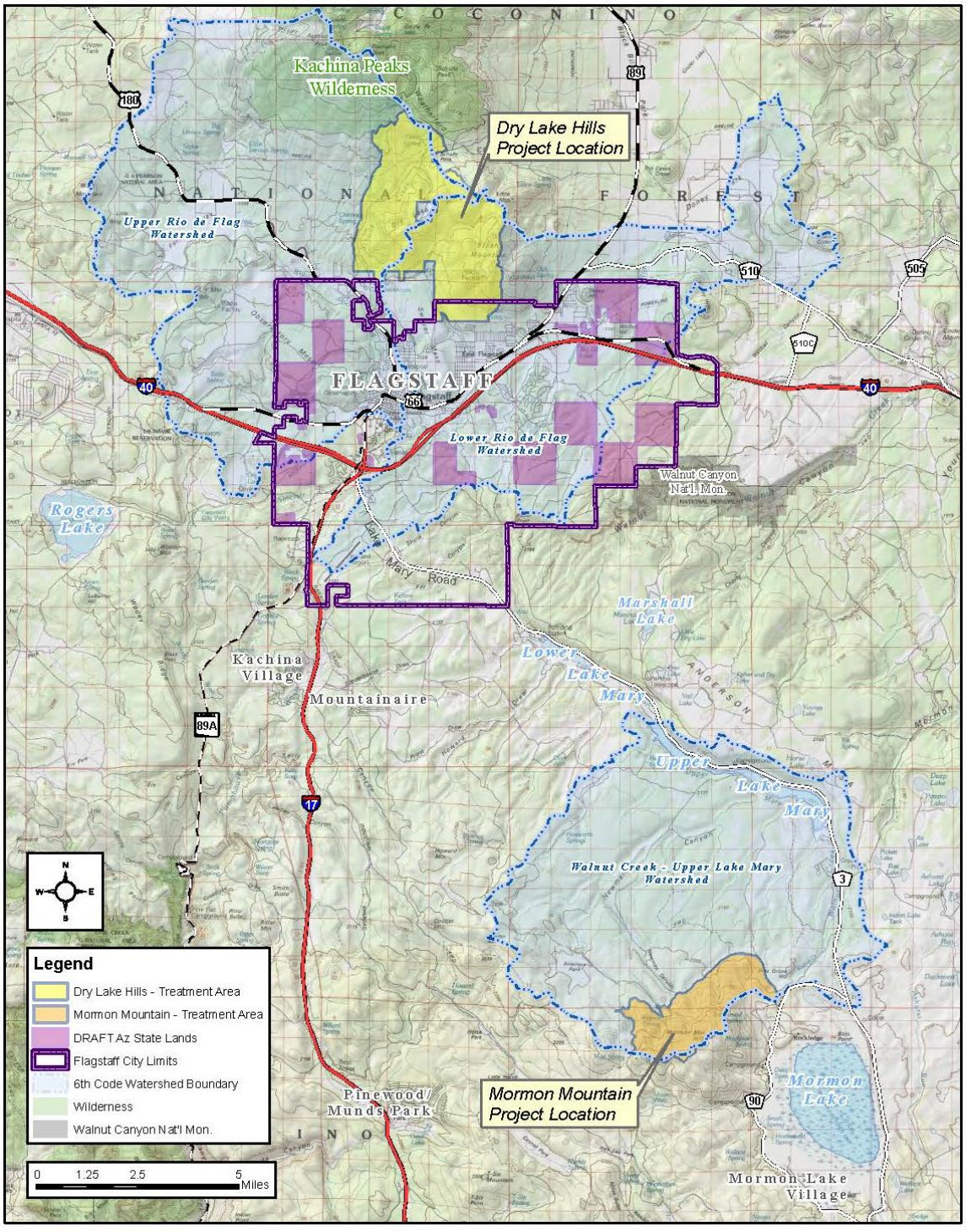
of Flagstaff passed a $10 million bond with 73 percent approval to support forest treatments within these two watersheds on the Coconino National Forest and also on State of Arizona lands. Identified on the ballot as the "Forest Health and Water Supply Protection Project," the planning effort on the National Forest segment is now known as the "Flagstaff Watershed Protection Project (FWPP)." Similar treatments may occur on approximately 3,000 acres of State of Arizona lands or on private lands as part of the overarching project funded through the City bond; however these activities are not included in this FWPP EIS planning effort as it pertains strictly to those actions proposed on the National Forest. Treatments on adjacent lands will be included in the cumulative effects analysis portion of the FWPP EIS.

The FWPP project area is of high scenic, cultural, wildlife, and recreational value. Public use of the project area is very heavy, with many heavily-used trails (for both motorized and non-motorized use), camping areas, and rock climbing areas. The area also has religious significance to several Native American tribes in the region.

Overlap between the Four Forests Restoration Initiative (4FRI) and the FWPP area is present; some areas that are already being analyzed by 4FRI are being included in this planning effort to address additional treatment options (such as treatments on steep slopes), while other 4FRI areas will not be reanalyzed. The Mount Elden/Dry Lake Hills (MEDL) Recreation Planning Project is also underway, and overlaps a majority of the project area within the Dry Lake Hills. While the purposes for the two projects differ, consistency between the proposed actions will be maintained as each moves through the analysis process to ensure there are no conflicts between proposals.

Currently about 1,872 acres within the general project boundary are already covered under previous NEPA decisions: Jack Smith/Schultz (2009) and Eastside (2007) Fuels Reduction and Forest Health Restoration Projects. The treatable areas covered under those decisions are either being currently implemented or will be implemented in the near future while the FWPP EIS planning process occurs on the rest of the project area. For example, the Orion Timber Sale (from the Jack Smith/Schultz Decision, 2009) is within the project boundary in the Dry Lake Hills and is anticipated to be treated in the Fall/Winter of 2013. Some areas within the Jack Smith/Schultz project area were either determined to be untreatable by ground-based equipment or were designated as No Treatment during that planning effort due to steep slopes and accessibility issues; those areas are being reanalyzed in the FWPP EIS.

Figure 1: General location of the project area in relation to Flagstaff and the two key watersheds



Existing Conditions

Existing conditions within the project area include dense stands with numerous dog-hair thickets on steep slopes with high fire risk, with a substantial wildland urban interface (Figure 2). Cover types in the project area include ponderosa pine, aspen, dry mixed conifer, wet mixed conifer, oak woodland, and grassland.

Based on stand surveys completed in 2012, the majority of the project area currently has a fire hazard rating of "extreme" (96 percent of the Dry Lake Hills and 93 percent of Mormon Mountain). Fire hazard ratings measure how intensely a fire would burn under hot, dry, and windy conditions during April through July, and include dead and down fuel loading (tons per acre), number of tree stems per acre, tree diameter, percent canopy closure, height to bottom of live crown (crown base height), tree height, slope and aspect in the calculations.

Figure 2: Looking down from Forest Road 557 (Elden Lookout Road) within the project area

There is also a high departure from historic vegetation conditions and fire return intervals within most of the project area. In general, fire regimes[1] in the analysis area have shifted from historically more frequent, lower-intensity surface fires (Fire Regime I and III, Condition Class I) to less frequent, higher-intensity crown fires (Condition Class III). This departure has created conditions where, if a wildfire were to occur, there would likely be more severe effects to ecosystem components (trees, soil, wildlife) than would have occurred under the natural fire regime.

A minority of the project area includes vegetation that likely naturally burned at moderate or high intensities during historic conditions. While these vegetation types are limited in the project area, these too would be treated to facilitate frequent, low-intensity wildfire to limit the potential for crown fire and subsequent flooding in and downstream of the project area.

Crown fire potential was also analyzed for both project areas using data generated from modeling performed using FlamMap 3.0. Three types of fires result from the modeling: **surface fire**, **passive crown fire**, and **active crown fire**. Surface fire describes fire that burns through the surface fuels of the forest floor. This type of fire has the least active of fire behaviors and is the most beneficial of the three types of fires in maintaining the historical, ecological role of low intensity, high frequency fire in the

[1] A fire regime generally classifies the role of fire over the landscape in the absence of modern human mechanical intervention. There are five natural fire regimes and are characterized based on average numbers of years between fires combined with fire severity of the dominant overstory vegetation. Fire Regime I (FRI) indicates a landscape with frequent fires (0-35 years) with surface to mixed burn severity. Fire Regime III (FRIII) indicates a landscape with fires every 35 to 200 years, with low to mixed burn severity.

southwestern ponderosa pine ecosystem. Passive crown fire, or torching, occurs when flame lengths are long enough to reach the lower edge of the canopy and can result in individual or small group tree torching but does not proliferate through the forest canopy through continuous crown fire spread. Active crown fire occurs when flames reach the forest canopy and spread through it with intensity and continuity.

The fuel moisture and weather characteristics used to model the effects and behavior of a potential wildfire for existing and desired conditions are 97th percentile conditions from the Flagstaff RAWS station and observed conditions on the Schultz fire on June 20th, 2010. The conditions used were as follows:

97th Percentile Conditions

- 1-hour fuel moisture: 2%
- 10-hour fuel moisture: 2%
- 100- hour fuel moisture: 4%
- 1000- hour fuel moisture: 7%
- 20-foot wind speed: 25 mph
- Air temperature: 85°F

Shultz Fire Conditions

- 1-hour fuel moisture: 2%
- 10-hour fuel moisture: 2%
- 100- hour fuel moisture: 6%
- 1000- hour fuel moisture: 11%
- 20-foot wind speed: 21 mph
- Air temperature: 75°F

The 97th percentile and the Schultz Fire weather conditions were used in modeling to give an overall worst case scenario in terms of crown fire potential, and also a comparable local reference. The 97th percentile conditions represent the top three percent (3%) worst fire weather days from 2002-2011, and the Schultz Fire was one of the biggest high intensity/stand replacing fires that has occurred recently within fifteen miles of Flagstaff, Arizona.

Table 1: Crown Fire Potential (97th percentile) for the Project Area (with percent of project area)[2]

CROWN FIRE POTENTIAL	DRY LAKE HILLS	MORMON MOUNTAIN	TOTALS
Surface Fire	1,189 acres (16%)	256 acres (9%)	**1,445 acres (14%)**
Passive Crown Fire	1,741 acres (23%)	188 acres (6%)	**1,929 acres (18%)**
Active Crown Fire	4,610 acres (61%)	2,522 acres (85%)	**7,132 acres (68%)**
TOTALS	**7,540 modeled acres**	**2,966 modeled acres**	**10,506 acres**

Table 2: Crown Fire Potential (Schultz Fire Conditions) for the Project Area (with percent of project area)[3]

CROWN FIRE POTENTIAL	DRY LAKE HILLS	MORMON MOUNTAIN	TOTALS
Surface Fire	3,008 acres (40%)	789 acres (27%)	**3,797 acres (36%)**

[2] Acreages and percentages may differ slightly between tables due to rounding. Approximately 18 acres were also classified as "no data" for use in this model.

[3] Though the scenario modeled under the Schultz Fire weather conditions shows that a large percentage of the project area would experience surface fire (36%), this is a conservative estimate based on the model itself. It is likely that a higher percentage of the project area would actually experience more active fire behavior based on what occurred during the Schultz Fire and the existing conditions described in Table 3.

Passive Crown Fire	3,169 acres (42%)	754 acres (25%)	**3,923 acres (37%)**
Active Crown Fire	1,362 acres (18%)	1,421 acres (48%)	**2,783 acres (26%)**
TOTALS	**7,539 modeled acres**	**2,964 modeled acres**	**10,503 acres**

Desired Conditions

The desired condition is to reduce the threat of high severity wildfire and subsequent flooding to values at risk within and adjacent to the project area, including the City of Flagstaff, outlying communities, the Kachina Peaks Wilderness, and Upper Lake Mary. For the majority of the project area, the desired condition is to decrease the departure from historic conditions, and return the majority of the analysis area in FRI and FRIII to Condition Class 1.

Table 3 displays the existing and desired conditions for the FWPP project area. Desired future conditions include lowering the extreme fire hazard risk by reducing ladder fuels (crown base height), the dead vegetation on the forest floor (dead and down fuel) and the heavy fuel live fuel loading (stems per acre), opening the spacing between trees (canopy closure), and returning the project area to more historical vegetative conditions and fire regimes. Desired conditions also include reducing potential fire intensity so that more of the project area would experience surface fire with low soil burn severity instead of active or passive crown fire with high soil burn severity.

Table 3: Existing and Desired Conditions for the Project Area

Measure	Existing	Desired*
Crown Base Height	0-84 feet	20+ feet
Dead and Down Fuel	0.1-50 tons/acre	3-7 tons/acre in ponderosa pine; 10-15 tons/acre in mixed conifer
Canopy Closure	2-100%	40-70%
Cover Type	Mostly ponderosa pine with mixed conifer, juniper, and mixed hardwood	Same but with reduction of encroachment of fire intolerant species
Stems per acre	10-5218	Less than 300
Flame length	Modeled from 3 to 140 feet, depending on the fuel model[4]	Less than 4 feet in the ponderosa pine and mixed conifer; less than 10 feet in the brush and grass

* Desired conditions in this table are averaged across the entire project area and do not reflect the variances that would occur between different vegetation types. For example, within meadows, the canopy cover would be much less than within mixed conifer vegetation types.

[4] Flame lengths produced under existing conditions were determined using the FFE (Fire and Fuels Extension) in FVS, modeled under 97th percentile conditions. Fuel model descriptions can be found in Scott and Burgan (2005)

Project Purpose & Need

The primary purpose of the Flagstaff Watershed Protection Project (FWPP) is to reduce the risk of high severity wildfire and subsequent flooding in two key watersheds around Flagstaff, Arizona: in the Dry Lake Hills portion of the Rio de Flag Watershed, and the Mormon Mountain portion of the Upper Lake Mary Watershed (see Figure 1).

The FWPP analysis area includes portions of the Coconino National Forest that have either not been analyzed or not been treated previously due to prohibitive costs associated with very steep terrain, low value material, and other challenging issues such as potential impacts to wildlife and visual concerns.

There is a need to reduce the risk of fire and post-fire flooding that would likely damage the drinking water infrastructure south of town and which could also cause extensive damage to residential and commercial areas should a high-intensity wildfire occur in mountainous areas that make-up the Upper Lake Mary and Rio de Flag watersheds.

More specifically, there is a need to reduce the potential for crown fire and high intensity surface fire, and to reduce the likelihood of human-caused ignitions.

PROPOSED ACTION

To meet the project's purpose and need, the Forest Service proposes a combination of thinning and prescribed burning activities, establishing a permanent campfire closure order in the Dry Lake Hills area and decommissioning about 34 miles of road in the Flagstaff Watershed Protection Project area. To facilitate timber removal, approximately 15.5 miles of temporary road are also proposed, and three non-significant Forest Plan amendments would be necessarily to implement the proposed activities.

Treatment Summary

The FWPP project area includes approximately 10,543 acres; roughly 1,733 of those acres are either non-treatable due to rock faces and/or boulder fields, or are not slated to be re-analyzed in this project (see Table 4). Treatments would include mechanical and hand thinning as well as prescribed fire on the remaining acres (approximately 8,810 acres). See Table 4 and Figures 2 and 3 for more details.

Mechanical tree thinning would occur within Mexican spotted owl protected activity centers (MSO PACs) with a desired condition of trees greater than 16 inches dbh contributing more than 50 percent of the stand basal area and maintaining a minimum of 40 percent canopy cover in pine-oak and 60 percent in mixed conifer per the MSO Recovery Plan (2012), followed by prescribed burning. Thinning would also occur within MSO nest/roost habitat in coordination with the US Fish and Wildlife Service (FWS) to reduce the risk of high severity wildfire (See Table 4 for more information). Some treatments proposed within occupied PACs may need to occur during the breeding season (March 1-August 31) and would be coordinated with FWS.

Prescribed fire would include initial pile burning to remove slash accumulated through harvesting, followed by broadcast burning. Maintenance burning may occur every five to seven years following implementation in order to maintain lower fuel loading levels and to restore a frequent, low-intensity fire regime. Areas of mixed conifer on steep slopes may not receive prescribed burning treatments due

to the difficulty of implementation in these fuel types and terrain, and also because the vegetation type may not require regular burning due to longer historical fire intervals.

Table 4: Proposed Treatment Descriptions and Objectives

Treatment Type	Treatment Description/Objective	Acres
Ponderosa Pine Fuels Reduction	These treatments areas are outside of MSO PACs and northern goshawk PFAs and nest cores. Mechanical treatment designed to develop uneven-aged structure and a mosaic of interspaces[5] and tree groups of varying sizes. Interspaces would occupy 30 -60 percent of the treatment area. Tree groups would vary in shape, size, density, and number: generally from 0.05 – 0.7 acres in size with residual group basal areas of 20-80 ft2 per acre and 2-40 trees per group.	2029 – Dry Lake Hills (DLH) 714 – Mormon Mountain (MM)
Mixed Conifer Fuels Reduction	These treatments areas include dry mixed conifer areas outside of MSO PACs, replacement nest/roost habitat, and northern goshawk PFAs and nest cores, but include MSO restricted habitat. Mechanical treatment designed to develop uneven-aged structure and a mosaic of interspaces and tree groups of varying sizes. Interspaces would occupy about 30-60 percent of the treatment area. Tree groups would vary in shape, size, density, and number: generally less than one acres in size with residual group basal areas of 30-90 ft2 per acre and 2-50 trees per group	1593 - DLH
MSO PAC Fuels Reduction - Wet Mixed Conifer	Mechanical treatment designed to break up the over-story canopy within MSO PACS in the wet mixed conifer vegetation type by creating small openings across 10-30 percent of the treatment area to regenerate early seral species. Reduce basal areas to 80-100 ft2.	143 - MM
MSO PAC Fuels Reduction	Mechanical treatment to create a diversity of patch sizes with minimum patch size of 2.5	1221 – DLH 1682 - MM

[5] Interspace: the space between groups and clumps of trees (VSS 1-6) that are intended to be dominated by grass/forb/shrub vegetation and may include scattered individual trees. See Appendix B for more details.

	acres. Provide for 10-30 percent openings across treatment areas from 0.1 – 2.5 acres in size. Maintain a minimum of 40 percent canopy cover in pine/pine-oak and 60 percent in mixed conifer. Post-treatment, trees greater than 16" dbh would contribute at least 50 percent of the stand basal area per MSO Recovery Plan guidelines (2012).	
MSO Nest Fuels Reduction & MSO Nest/Roost Recovery	Mechanical or manual treatment of MSO core areas and MSO nest/roost recovery habitat (aka target threshold) would occur in coordination with the US Fish and Wildlife Service. Residual basal area would be a minimum of 110 ft2 in ponderosa pine, and 120 ft2 in mixed conifer. Maintain a minimum of 40 percent canopy cover in pine/pine-oak and 60 percent in mixed conifer. Post-treatment, a minimum of 12 trees greater than 18" dbh per acre would be present; trees greater than 12-18" dbh would comprise over 30 percent of stands, per the MSO Recovery Plan guidelines (2012).	396 – DLH 402 – MM & 22 - MM
Northern Goshawk Post Fledging Areas (PFA) Fuels Reduction	Uneven-age mechanical treatment designed to develop uneven-aged structure and a mosaic of interspaces and tree groups of varying sizes. Interspaces would occupy 20 -40 percent of the treatment area. Tree groups would vary in shape, size, density, and number: generally from 0.05 – 0.7 acres in size with residual group basal areas of up to 30-90 ft2 per acre and 2-40 trees per group	284 - DLH
Northern Goshawk Nest Fuels Reduction	Mechanical treatment designed to develop northern goshawk nest stand conditions consisting of a contiguous over-story of large trees. Basal area of 70 ft2 or greater would be maintained, and Forest Plan guidelines for canopy cover would be met.	103 - DLH
Aspen Treatment	A variety of different treatments would be used to promote and protect aspen health and regeneration, including the removal of post settlement conifers within 100 feet of aspen clones, prescribed fire, ripping, planting, fencing	22 – DLH

	and/or cutting of aspen to stimulate root suckering.	
Grassland Restoration	Mechanical treatment to remove encroaching post-settlement conifers and restore the pre-settlement tree density and patterns.	59 – DLH
Burn Only	Burn only treatment would remove excessive fuel loading in areas which were previously burned by the Radio Fire	138 - DLH
Electronic Site – Structure Protection	These sites are occupied by telecommunication facilities, and would be treated to provide a sufficient defensible space around these structures from a wildland fire. Individual trees that are determined to contribute to wildfire risk or pose a hazard to the electronic sites would be removed. The remainder of the sites would receive a thin from below to approximately 20 – 40 ft2 basal area with the purpose of raising the crown base height and leaving the largest and most fire resistant trees.	6 – DLH 12 - MM
No Treatment (No New Analysis)	These acres include non-treatable areas, including rock faces and boulder fields, and the Orion Timber Sale (approximately 832 acres). Though the Timber Sale is within the project boundary, the treatments for that area were analyzed and authorized under the Jack Smith Schultz Fuels Reduction and Forest Health Restoration Project Decision Notice/Finding of No Significant Impact (2008). No additional treatments within the Timber Sale area are proposed under FWPP.	1733 - DLH

Figure 3: Proposed Treatments in the Dry Lake Hills Area

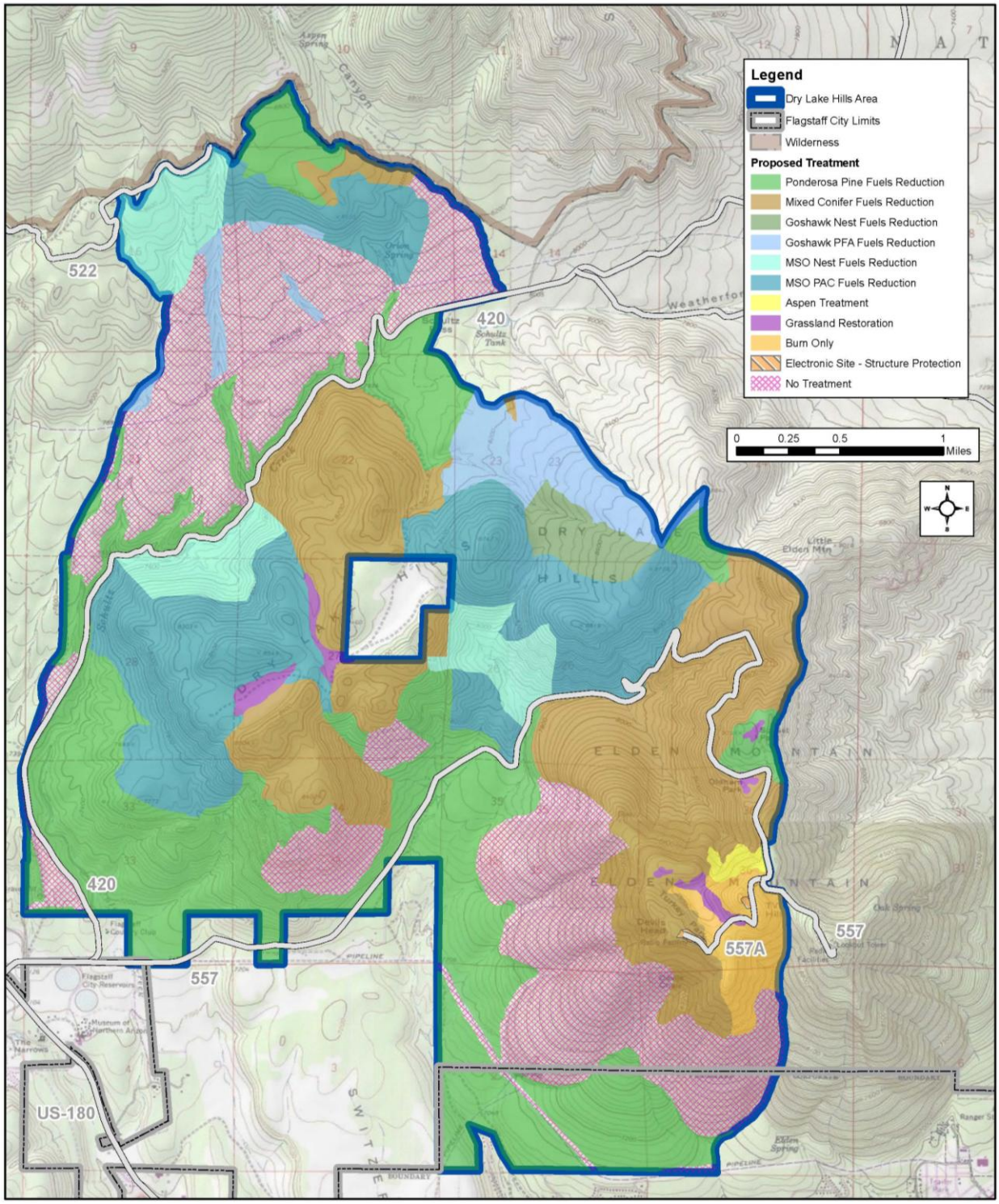
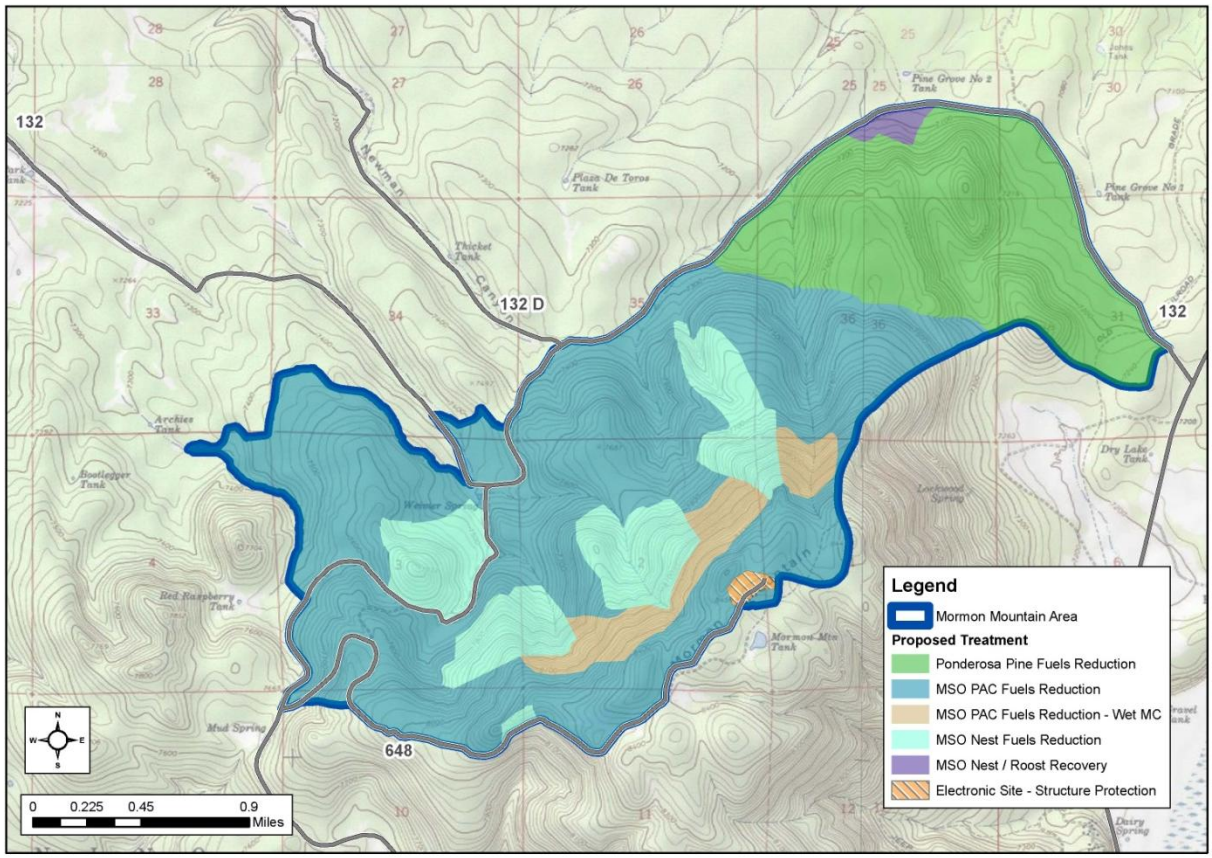


Figure 4: Proposed Treatments in the Mormon Mountain Area



Implementation Methods

Harvesting methods would primarily depend on slope and terrain. Figures 5 and 6 (below) show the slope limitations within the Dry Lake Hills and Mormon Mountain areas: the areas in grey and light green correspond with conventional ground-based harvesting activities described below; the dark green and red areas correspond with the steep slope ground-based harvester and forwarder, cable or aerial harvesting activities. Biomass[6] removal could occur in areas identified for potential ground based harvesting.

Ground Based Harvesting- Conventional ground based harvesting up to 40 percent slope; slopes over 25 percent may require a tracked, leveling feller-buncher rather than a wheeled feller-buncher. Areas implemented under these methods would be skidded with a wheeled or tracked skidder.

Steep Slope Harvesting – These areas would require either cable yarding, helicopter logging, or timber removal with a steep slope harvester and forwarder. This would also include areas that are yarded with an off-road cable yarder also known as an excaliner. Some areas within the classification may also have trees cut, piled and burned in place rather than extracted.

[6] Biomass is defined as material from trees and woody plants, including limbs, tops, needles, leaves and other woody parts that are the by-products of vegetation management activities.

Biomass Removal– If a market for biomass exists during the time of implementation, biomass removal methods may be utilized in place of pile burning.

Transportation Plan

Existing roads would be used to the extent possible for hauling harvested trees. Forest Roads (FR) 420, 556 and 557 would be used as the main haul routes for Dry Lake Hills; FR 132, 132A, and 648 would be used as the main haul routes for Mormon Mountain. Maintenance on these roads would be necessary prior to implementation, including reconditioning and resurfacing of FR 420, 556 and 132. In addition, there may be a need to transport harvested trees through the City of Flagstaff to access the Interstate system (I-40 and I-17).

However, it is likely that not all treatment areas would be accessible by existing roads. Based on the implementation methods listed above, approximately 15.5 miles of temporary roads may need to be constructed to assist with tree harvesting and removal. The precise location of temporary roads cannot be determined until a contract for treatment is secured and the type of equipment to be used is determined; however no temporary roads would be located within Mexican spotted owl nest cores. All temporary roads, landings, and skid trails used would be pre-approved by the Forest Service Timber Sale Administrator in accordance with resource protection measures.

All temporary roads would be rehabilitated after harvesting has been completed, which may include lopping and scattering slash, ripping or other closure and rehabilitation methods (see list below). However the Mount Elden/Dry Lake Hills Recreation Planning Project proposed action may include proposing road-to-trail conversions for some of the temporary roads if the locations meet the purpose and need for that project. Applicable Coconino National Forest Management Plan (Forest Plan) direction, Best Management Practices (BMPs), Forest Service Manual and Handbook direction, as well as standard mitigation measures would be implemented.

Road Decommissioning and Closures

The project area contains approximately 34 miles of roads closed to motorized travel through the Travel Management Rule (TMR) decision (September 2011), all of which would be decommissioned upon project completion. Preventing unauthorized motor vehicle use on these routes would limit the potential for human-ignited wildfires in the project area, restore forest vegetation, and reduce the potential for increased erosion subsequent to a fire. Decommissioning could consist of any or all of the following, and would be determined by the District on a case-by-case basis:

- Rolling windrows back into the road bed along its entire length
- Scarifying to a depth of 4 to 5 inches in the road bed along its entirety, if necessary to prepare a seed bed. This would be accomplished 45 degrees or less to the existing fall line or slope to minimize erosion.
- Installing/maintaining adequate drainage structures (i.e. water bars, cross ripping, outsloping) with locations identified by FS.
- Scattering slash randomly along the road, heavily along the ripped portion.
- Re-contouring where applicable (cross-sloped).

- Seeding with native seed species the entire length.
- Removal of any posted road designators (road numbers, names)
- Changing the status in the FS database used to track roads
- Obliteration of the road bed to some degree

Campfire Closure Order

The proposed action would also include establishing a permanent campfire restriction order in the Dry Lake Hills portion of the project area to limit the potential for human-caused wildfire. The current temporary campfire restriction order (Number 04-11-06-F) has been in effect since June, 2011, and prohibits building, maintaining, attending, or using a fire, campfire[7], or stove fire[8] (**36 CFR § 261.52(a)).** The Proposed Action would extend this order permanently in the project area.

Forest Plan Amendments

Three project-specific, non-significant amendments to the Coconino National Forest Land Management Plan (Forest Plan; 1987, as amended) would be required to implement the proposed action (see Appendix B). A site (project) specific plan amendment is a one-time variance in Forest Plan direction for the project; Forest Plan direction reverts back to its original language/direction upon completion of the specified project. The language proposed does not apply to any other forest project.

The Forest Plan is currently under revision; depending on the timing of the release of the final Forest Plan document, the final FWPP analysis will be consistent with the revised Forest Plan. Additionally, a revised MSO Recovery Plan, issued by the U.S. Fish and Wildlife Service (FWS) was finalized in December of 2012 (USDI 2012). The current Forest Plan is consistent with the previous MSO Recovery Plan (USDI 1995). For this project, a Forest Plan amendment would be needed to utilize the revised recovery plan direction if it is different than what is currently included in the Forest Plan. The proposed Forest Plan amendments include:

Amendment 1: Adding the desired percentage of interspace within uneven-aged stands to facilitate restoration in northern goshawk habitat (excluding nest areas), add the interspace distance between tree groups, add language clarifying how canopy cover would be measured, and add a definition to the Forest Plan glossary for the terms “interspaces,” “open reference condition,” and “stands.”

Amendment 2: Adding language to allow mechanical treatments in MSO PACs beyond 9 inches dbh, treatments in MSO restricted habitat above 24 inches dbh, and also to allow treatments and prescribed burning within MSO nest/cores. The monitoring requirement specified under the Forest Plan would be amended to include the monitoring plan developed by the Forest Service, U.S. Fish and Wildlife Service, and the Rocky Mountain Research Station referenced in the following section titled, “Monitoring.” This amendment would also remove timing restrictions within MSO PACs for the duration of the FWPP

[7] Campfire: means a fire, not within any building, mobile home or living accommodation mounted on a motor vehicle, which is used for cooking, personal warmth, lighting, ceremonial, or aesthetic purposes. Fire includes campfire.

[8] Stove fire: means a campfire built inside an enclosed stove or grill, or a portable brazier, including wood and charcoal fires.

project. Treatments within PACs would be prioritized to be accomplished as quickly as possible to reduce the likelihood of long-term impacts, and would be coordinated with FWS.

Amendment 3: Removing language restricting mechanical equipment to slopes less than 40 percent and language identifying slopes above 40 percent as inoperable. This amendment would allow mechanical harvesting on slopes greater than 40 percent within the project area. Since the Forest Plan was written and amended, mechanized ground-based equipment has progressed to be able to operate on steep slopes more effectively. In order to be able to utilize such equipment to treat slopes above 40 percent in the project area and meet the purpose and need, this Forest Plan amendment is needed.

Monitoring

The Mexican Spotted Owl Recovery Plan, First Revision (USFWS 2012) provides guidance for these treatments and emphasizes the need for monitoring and feedback loops to allow management to be adaptive. Well-designed monitoring would provide valuable information on the effects of these activities on the owls and their habitat. Therefore, the Forest Service is working with the U.S. Fish and Wildlife Service (FWS) and Rocky Mountain Research Station (RMRS) to propose a monitoring plan that would assist in determining the effects of thinning and burning on Mexican spotted owls and their habitat. The monitoring plan would include the details for sample selection, treatment specifics, measurement protocols including timing, and planned analyses. The monitoring plan will be reviewed as part of the consultation process for treatments planned to occur within PACs.

The proposed monitoring plan would pair treated and untreated (reference) PACs within the Dry Lake Hills and Mormon Mountain portions of the project and compare occupancy rates, reproduction rates, and habitat changes. Reference PACs would match the environmental conditions in PACs where treatments are proposed, as closely as possible.

Design Features

The proposed action is designed to comply with Forest Plan standards and guidelines, as amended. Design features would be incorporated into the project to protect forest resources of soil, water, scenery values, wildlife and aquatic habitat, and rare plants. Mitigation measures and best management practices would be implemented during the project to reduce impacts to wildlife, to protect heritage resources, to prevent the introduction and spread of invasive plants, and to protect public health and safety. See Appendix A for a list of design features associated with the proposed action.

Level of Environmental Analysis

The Proposed Action and any alternatives for the Flagstaff Watershed Protection Project will be analyzed in an Environmental Impact Statement (EIS) as described in Forest Service Handbook 1909.15, Chapter 40. The EIS will fully describe and evaluate the proposed action and alternatives for meeting the purpose and need.

Possible Alternatives

In addition to the Proposed Action, the No Action Alternative will be analyzed. No Action will consider the effects of not completing the proposed actions within the FWPP area.

Based on significant issues identified during scoping, other alternatives may be developed. The full development and analysis of alternatives will be completed following public response to this scoping effort and will be addressed in the Draft Environmental Impact Statement (DEIS), anticipated for release in early 2014.

Decision Framework

Because the proposed action includes timber harvest exceeding the delegated authority of the District Ranger, the Forest Supervisor is the responsible official for deciding whether or not, and in what manner, lands within the Flagstaff Watershed Protection project area would be treated to reduce wildfire and flooding hazards.

Items in this decision will include:

- number of acres treated mechanically
- number of acres treated by hand thinning
- number of acres treated with prescribed fire
- treatments within the MSO restricted habitat
- treatments within MSO PACs and protected habitat
- treatments within northern goshawk habitat
- construction of new temporary roads
- decommissioning/obliteration of closed roads
- type of implementation method to be used
- issuance of a permanent campfire restriction order in the Dry Lake Hills
- project-specific Forest Plan amendments
- design features to protect forest resources of soil, water, scenery values, wildlife and habitat, and rare plants

The decision will be based on a consideration of the environmental effects of implementing the proposed action or alternatives. The Forest Supervisor may select the proposed action, any alternative analyzed in detail, a modified proposed action or alternative, or no action.

Your Involvement

This project is subject to the objection process pursuant to 36 CFR part 218 (March 27, 2013), and is not being authorized under the Healthy Forest Restoration Act (HFRA). As such, those who provide specific written comments during the formal scoping and/or comment periods in accordance with §218.5 will be eligible to participate in the objection process. Issues raised in objections must be based on previously

submitted timely, specific written comments regarding the proposed project unless new information arises after designated opportunities (36 CFR 218.7).

The formal scoping period will end 30 days from publication of the Notice of Intent (NOI) in the Federal Register; this publication date is the exclusive means for calculating the time to submit a comment. Individuals or organizations wishing to submit comments should not rely upon dates or timeframe information provided by any other source. It is important that reviewers provide their comments at such times and in such manner that they are useful to the agency's preparation of the environmental impact statement. Therefore, comments should be provided prior to the close of the scoping period and should clearly articulate the reviewer's concerns and contentions.

Comments received in response to this solicitation, including names and addresses of those who comment, will be part of the public record for this proposed action. Comments submitted anonymously will be accepted and considered, but will not be eligible for objection per §218.5.

If you have information you feel the Forest Service may not be aware of, or have input regarding this proposed action, please send that information to Erin Phelps, Project Leader, on the Flagstaff Ranger District by regular mail to 5075 N. Highway 89, Flagstaff, AZ 86004; by fax at 928.527.8288; by phone at 928.527.8240; or by email to comments-southwestern-coconino-flagstaff@fs.fed.us. Comments may also be hand delivered to the Flagstaff District Office at the above address between 8:00 am and 4:30 pm, Monday through Friday, except holidays.

Multiple public meetings will be held throughout the planning process for the FWPP project, including a general information sharing and comment gathering meeting scheduled for **May 1, 2013** at the Aquaplex in Flagstaff (1702 N. 4th Street) from 6:00 to 8:00 p.m. The Greater Flagstaff Forests Partnership (GFFP) will also be hosting meetings on behalf of the City of Flagstaff. Please visit the FWPP project website at http://www.flagstaffwatershedprotection.org/ for more information and a calendar of upcoming meeting dates.

Figure 5: Harvest Option Slope Limitations in the Dry Lake Hills area

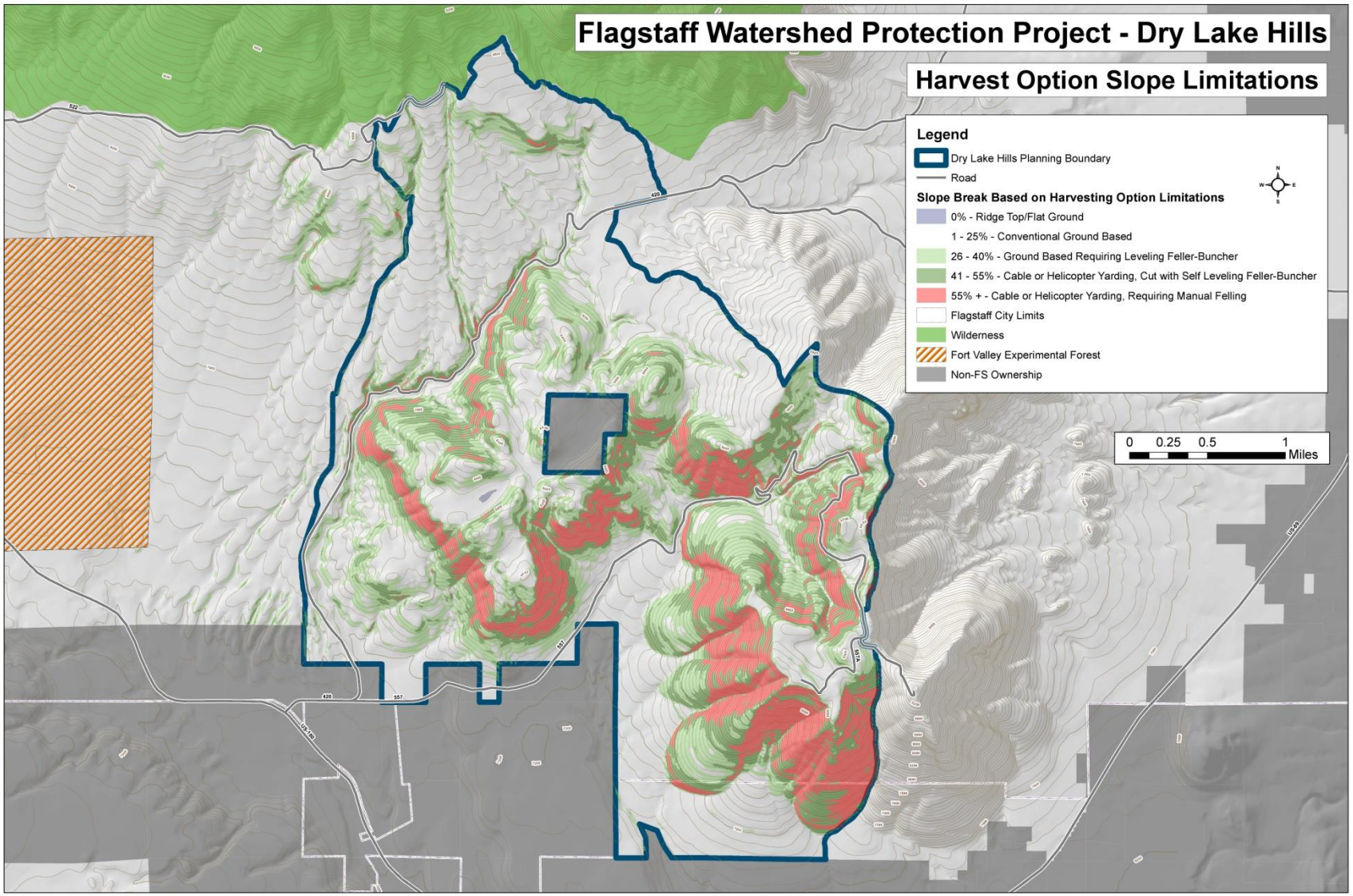
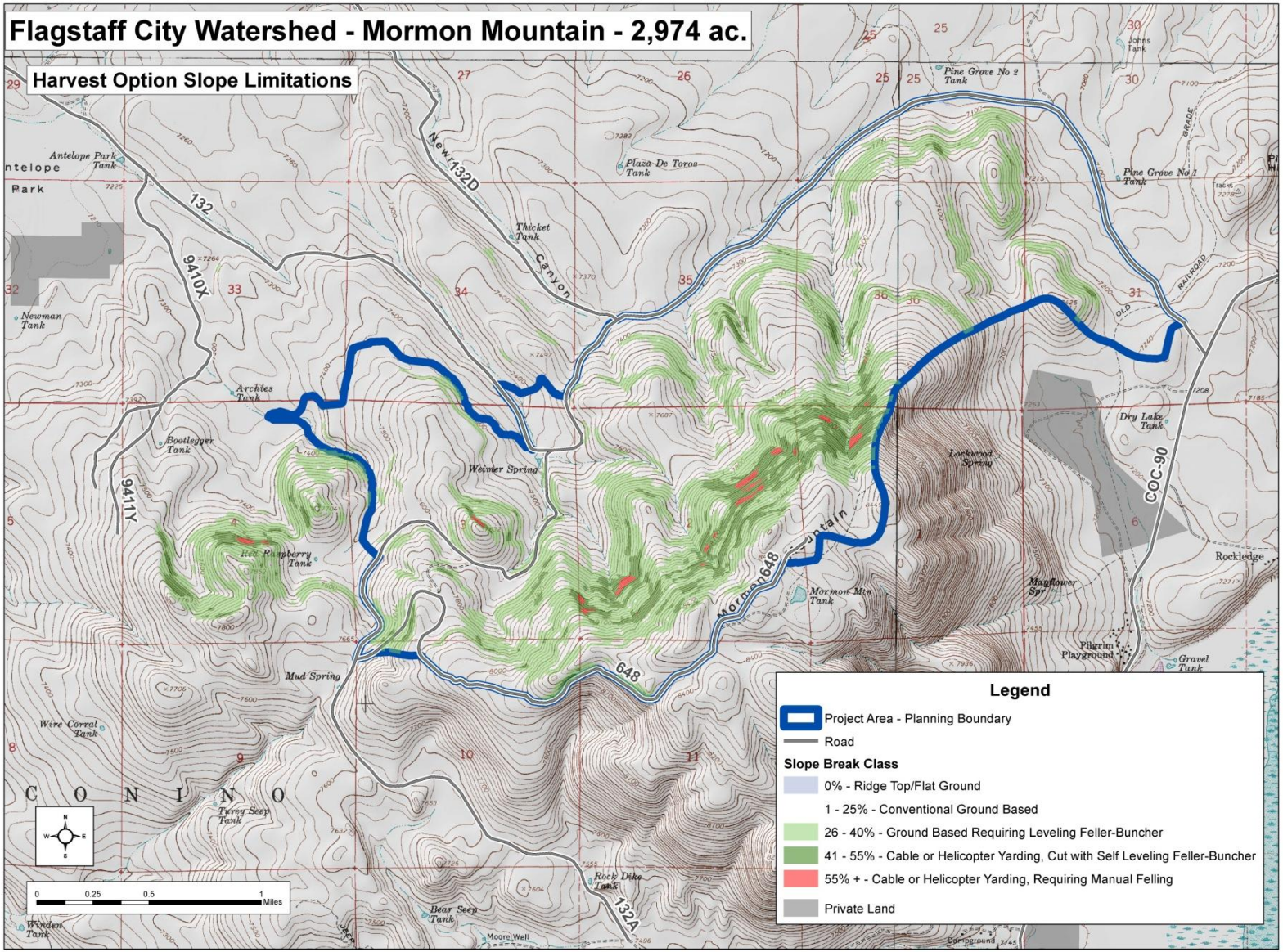


Figure 6: Harvest Option Slope Limitations for the Mormon Mountain Area



Appendix A – Design Features

Specialist Area	Related Resource	Mitigation Measure
Silviculture	Old Trees	Emphasize retaining old, pre-settlement trees where possible, particularly within MSO recovery nest/roost habitat. Old trees, as defined by Thomson (1940), would not be targeted for cutting. However, exceptions may be necessary. An example of this would be removing an old tree to address human health and safety concerns and OSHA regulations if these trees are considered to be dangerous. Another instance would be to cut an old tree in order to accommodate the turning radius of a logging truck, rather than relocating an entire road, or if they are located within a cable yarding corridor.
	Mixed Conifer	Treatments within both dry and wet mixed conifer vegetation types would be site-specific in nature and vary according to the diversity of tree species compositions and locations. Treatments would be designed to enhance historic tree species composition while reducing the risk of high-severity wildfire.
Heritage	Site Protection	All fire intolerant sites would be marked for avoidance from prescribed burning and all National Register of Historic Places (NRHP) eligible or unevaluated sites would be protected from ground disturbing activities.
	Monitoring	Archaeological site conditions should be monitored after project implementation to address potential looting and vandalism due to increased traffic and visibility resulting from the removal of ground cover currently concealing many sites from view.
Wildlife	Mexican Spotted Owl	• MSO surveys would be coordinated with the Fish and Wildlife Service the year of implementation or one year prior to determine occupancy of owls. • The FWPP project boundary lies within the project boundary for 4FRI as well as other forest thinning and burning projects. Flagstaff Ranger District staff would ensure that all proposed treatments are coordinated to ensure that there are not multiple entries into sensitive habitats (such as MSO PACs) that are split between different project boundaries. In doing so, habitat and noise disturbance to these areas would be minimized. • The Forest Service would monitor effects to MSO from the proposed action and report their

		findings to the FWS. Implementation monitoring would include information such as when or if the project was implemented, whether the project was implemented as analyzed in the site specific BO (including conservation measures, and best management practices), breeding season(s) over which the project occurred, relevant MSO survey information, and any other pertinent information about the project's effects on the species. Treatment activities within PACs would be assessed through implementation of the monitoring plan designed with FWS. • Minimize thinning, prescribed burning, temporary road construction, maintenance or obliteration within occupied PACs during the breeding season (March 1 to August 31). • No thinning or prescribed burning would occur within occupied MSO nest/cores during the breeding season (March 1 to August 31). • Coordinate burning spatially and temporally to limit smoke impacts to nesting owls (March 1 to August 31).
	Northern Goshawk	• Minimize harvest activities within a 1/4 mile of occupied nests (potentially adjusted by topography) during the breeding season (March 1 to September 30). • Prescribed burn plans in northern goshawk PFAs would be designed and implemented to minimize smoke impacts to nesting birds and minimize loss of nest trees.
	Other Wildlife	• No vegetation treatments would occur within a ½ mile (2,500 ft.), unless mitigated by topography, of an occupied golden eagle nest between March 1 and August 31 (there is 1 golden eagle nest within the analysis area). Other project activities would be assessed by the district biologist and limited activities may be acceptable. • Burn plans within 1/2 mile of the golden eagle nest site and peregrine falcon eyries would be coordinated with the district wildlife biologist to insure nesting eagles and falcons would not be adversely impacted from smoke. • Hiding cover would be maintained near dependable waters by not targeting drainages for interspaces and openings, and through implementation of watershed BMPs. • Tanks within ¼ mile of known northern leopard frog sites would be surveyed prior to implementation. If northern leopard frogs are detected, a buffer for no treatments (no thinning, no direct ignition) would be identified to protect occupied tanks. • A 200-ft protection zone (100 feet either side of streamcourse) would be established around

		designated stream courses for northern leopard frogs. There would be no thinning and no direct ignition of prescribed burning within the protection zones. Designated skid trail crossings through the buffer zones are allowed.
	Snags	• Biologists would identify patches of snags up to 10 acres in size in advance of treatment unit layout. This would allow for the protection of patches of snags that could serve as a reserve area for areas/acres where we are unable to maintain snags during operations. • Where helicopter logging is used, consider using patch cuts in order to break up fuels. This would allow for the maintenance of snags outside the patches, but would allow for greater removal of trees (live and dead) and operational safety within the patches. • Use logging systems when feasible in sensitive habitats that can meet project objectives and maintain important structural components (e.g., snags, etc.). • Protect snags and logs wherever possible through site prep, implementation planning, and ignition techniques to retain ≥ 2 snags per acre ≥18 inches dbh and ≥30 ft in height and ≥3 logs with ≥ 12 inches mid-point diameter and ≥ 8 ft in length in ponderosa pine and ≥ 3 snags per acre ≥18 inches dbh and ≥30 ft in height and ≥5 logs with ≥12 inches mid-point diameter and ≥ 8 ft in length in mixed conifer and spruce-fir • Retain ≥ 2 trees per acre ≥18 inches dbh with dead tops, cavities, and lightning strikes wherever possible to provide for replacement snags and cavity nesting/foraging habitat • Emphasize retention of snags exhibiting loose bark to provide habitat for roosting bats. • Create snags in key areas (i.e. PACs, recovery nest roost habitat) where monitoring determines a deficit.
Botany	Noxious/Invasive Weeds	Best Management Practices as outlined in Appendix B of the "Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds" (USDA Forest Service 2005) would be followed to incorporate weed prevention and control into the project. The following features would be incorporated into project implementation and monitoring: • Treat weed infestations within stands before implementing project activities. Avoid known populations of noxious or invasive weed during project activities. • Survey temporary roads and roads to be closed or obliterated before work begins. Avoid existing noxious or invasive weeds during soil disturbing activities associated with

		obliteration. • Prevent the spread of potential and existing noxious or invasive weeds by vehicles used in management activities by incorporating weed prevention and control into project layout, design, and implementation. • Fully incorporate the equipment cleaning provisions of the timber sale and/or stewardships contracts into the implementation contract(s) to prevent the introduction or spread of noxious or invasive weeds. • Clean all equipment of seeds, soil, vegetative matter, and other debris that could contain or hold seeds before entry into a project area. Clean vehicles, machinery and tools before moving from infested areas into uninfected areas. • When in areas where known noxious weeds exist, designate turnaround sites for log trucks and other large equipment that are weed free. • Manage prescribed fires as an aid to control of existing weed infestations and to prevent the spread of existing weeds through coordination with the District Weeds Coordinator. • Place slash piles on previously used locations such as old piling sites, old log deck sites, or other disturbed sites to avoid severe disturbance to additional locations where possible. • Monitor slash pile sites after burning and if found, control noxious or invasive weeds. • Avoid acquiring water for dust abatement from weed-infested areas. • Minimize period from end of project activities to site preparation, revegetation, and contract closure.
	Sensitive Plants	• Determine potential occurrences and habitat of Region 3 sensitive plants in potential activity areas when planning for implementation. Identify potential species and survey the area to be treated before implementation. • Mitigate negative effects from management actions on Region 3 sensitive plants during design and implementation. • Prohibit slash pile construction within populations of Region 3 sensitive plants • Construct slash piles at least 10 to 20 feet away from known populations of Region 3 sensitive plants. • Prohibit temporary road construction or reconstruction within populations of Region 3

		sensitive plants • Prohibit construction, reconstruction or log landings in identified populations of Region 3 sensitive plants • Deferrals and groups may include Region 3 sensitive plant groups where practical, using areas not occupied by the plants as interspaces. • Review watershed BMPs for project area and incorporate mitigations for Arizona sneezeweed into BMPs • Manage prescribed burns to promote native species and to hinder weed species germination. • Monitor the effects of treatment on Region 3 sensitive plants after treatments are completed.
Soil/Watershed	General	In order to avoid negative impacts to soils and water resources, best management practices (BMPs) would be implemented for prescribed fire and mechanical vegetation treatment measures. These resource protection measures are derived mainly from the Soil and Watershed Conservation Practices Handbook (USDA, 1990) and the National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1: National Core BMP Technical Guide (USDA, 2012). Resource protection measures are implemented to protect soils and minimize nonpoint source pollution as outlined in the intergovernmental agreement between the Arizona Department of Environmental Quality and the Southwest Region (Region 3) of the Forest Service (ADEQ, 2008). BMPs would be incorporated in prescribed fire burn plans and timber harvesting or stewardship contracts.
	Prescribed Fire	Incorporate prescription elements into the prescribed fire plan including such factors as weather, slope, aspect, soils, fuel type and amount, and fuel moisture in order to minimize high soil burn severity.
		Consider the spatial distribution and contiguous size of the planned burn area in a watershed during prescription development to reduce the effects of peak flow change on channels.
		At a minimum, all perennial water bodies, wetlands, and areas with riparian ecosystems would be designated as Aquatic Management Zones (AMZs), also called filter strips. Those stream channels that support seasonal flow in response to snowmelt and/or seasonal fluctuations in the water table would also be evaluated for potential designation as AMZs. AMZ widths would be

		adjusted based on the steepness of upgradient hillslopes with the following general guidelines: • AMZ width is the distance measured perpendicularly from the outer edges of the streamcourse (i.e., channel bank) or wetland. For stream courses or wetlands with upgradient hillslopes of 35 percent or less, the AMZ width would be 50'. For those with upgradient hilslopes greater than 35 percent, AMZ width would be 100'. As an example, the total width of an AMZ for a streamcourse with an upgradient hillslope exceeding 35 percent would be 200' plus the width of the streamcourse. • Equipment/vehicle staging areas, and fuel used for ignition devices would be located outside of AMZs. Ignition of fuels would not be initiated within AMZs. Hand piling and burning of slash within AMZs would be avoided to the extent practicable.
		Containment lines would be sited and constructed in a manner that minimizes erosion and prevents runoff from directly entering water bodies by consideration of placement relative to the water body(ies) and lay-of-the-land and through construction and maintenance of suitable drainage features such as water bars. To the extent possible, wetlands and riparian areas would be avoided. Where applicable, natural fire breaks such as outcrops would be used in lieu of ground-disturbing containment lines. In general, spacing of water bars would be such that water bars are located at eye level when viewed starting at the bottom of a slope and traversing upward.
		Containment lines would be rehabilitated by rolling back the soil berm formed during line construction and constructing drainage features as necessary to prevent concentration of runoff. Disguise containment lines to line of sight or first 300 feet, whichever is greater, from where they intersect trails or roads using native materials such as rocks and slash.
		Staging areas would be kept as small as possible while allowing for safe and efficient operation.
	Timber Harvesting	Prior to conducting harvesting activities, all Aquatic Management Zones (AMZs), staging areas (including areas where vehicles are serviced, equipment/chemicals are stored, and/or fuel is dispensed), primary skid trails, cable yarding corridors, temporary roads, and landings would be designated on a map and visibly marked by means of flagging or other suitable measures for

		approval by the timber sale administrator. Temporary fuel storage tanks would be permitted and installed in accordance with the Office of the State Fire Marshall requirements.
		To the extent possible, skid trail design would not include long, straight downhill segments which would concentrate runoff. If it is not operational feasible to avoid a long straight downhill segment, skid trail rehabilitation measures would be applied as soon as skidding is completed on that trail. Cable yarding corridors would be located to efficiently yard materials with the least soil damage. Skidding or cable yarding up or down drainage courses would not be permissible unless, in the case of cable yarding, logs are fully suspended.
		Aquatic Management Zones (AMZs)), also known as filter strips, streamside management areas, or protected streamcourses, are designated areas around water bodies in which certain activities are prevented or limited in order to minimize disturbance. At a minimum, all perennial water bodies, wetlands, and areas with riparian ecosystems would be designated as AMZs. Those stream channels that support extended flow in response to snowmelt and/or seasonal fluctuations in the water table would also be evaluated for potential designation as AMZs. AMZ widths would be adjusted based on the steepness of upgradient hillslopes with the following general guidelines: AMZ width is the distance measured perpendicularly from the outer edges of the streamcourse (i.e., channel bank) or wetland. Where upgradient hillslopes surrounding AMZs are 35 percent or less, AMZ width would be 70' for each side of streamcourse. If greater than 35 percent, AMZ width would be 120' for each side of streamcourse.
		The following activities would not be permissible in an AMZ: Staging areas, new temporary roads (except at designated stream crossings), landings, machine piling of slash, and primary skid trails (except at designated stream crossings). To the extent practicable, designated crossings of streamcourse AMZs by new temporary road or primary skid trails would be oriented perpendicular to the streamcourse.
		Insofar as safety permits, trees would be felled to angle in the direction of skidding.
		Drainage of roads would be controlled by a variety of methods including but not limited to insloping of the road bed toward an interior drainage ditch with periodic cross drains, outsloping

		of the road bed, crowning of the road bed, and construction of rolling dips and water lead off ditches. Drainage from landings and skid trails would be controlled to prevent concentration of runoff.
		Drainage of roads would be controlled by a variety of methods including but not limited to insloping of the road bed toward an interior drainage ditch with periodic cross drains, outsloping of the road bed, crowning of the road bed, and construction of rolling dips and water lead-off ditches. Drainage from landings and skid trails would be controlled to prevent concentration of runoff.
		Equipment would not be operated when ground conditions are such that excessive damage would result as visually monitored through such indicators as soil rutting.
		Machine piling of logging slash would be done in such a manner as to minimize the construction of new clearings for slash piles through use of natural openings, temporary roads, and landings.
		Skid trails and cable yarding corridors would be restored after use by a combination of any or all of the following practices in order to prevent the concentration of runoff in skid trails and to protect exposed soil: reshaping the surface to promote dispersed drainage (i.e., create convex vs. concave cross-section), installation of drainage features such as water bars to shed water, and spreading slash across skid trails and cable yarding corridors to protect areas where mineral soil is exposed. Where skid trails and or cable yarding corridors intersect existing roads or trails, native materials such as logs, slash, and/or boulders would be placed along skid trail or cable corridor to line-of-sight or first 300', whichever is greater.
		Temporary roads and landings would be restored after use by a combination of any or all of the following practices in order restore original topography, protect soils, and prevent concentrated runoff: roll berms created during temporary road and/or landing construction back across the disturbed surface to restore original surface topography to the extent practicable, install drainage features such as water bars where needed to prevent runoff from concentrating, and spread slash on areas with exposed mineral soil. Where temporary roads intersect existing roads or trails, native materials such as logs, slash, and/or boulders would be placed along temporary road to line-of-sight or first 300', whichever is greater.

		Where visual observation indicates that the above methods of erosion protection are inadequate, a certified weed-free mix of native or naturalized grasses would be broadcast evenly over the inadequately protected surface at the rate of 5 pounds per acre after surface scarification.
Recreation	Public Awareness	• Inform forest visitors about activities within the project area and make them aware of potential impacts when visiting this part of the forest. Provide information about implementation activities on the Forest website. • Issue news release(s) as appropriate when forest restoration activities are scheduled to occur and how it may affect forest visitation. • If it is necessary to close forest roads during harvesting operations, notices and signs would be posted at key locations adjacent to and within the project area to inform the public of these closures, in conjunction with issuing news releases as stated above. This may include major FS roads accessing the area, kiosks at trailheads, bulletin boards, electronic sign boards, etc. • Utilize dust abatement methods during haul of logs on unpaved roads near private land residences during the season when dust is likely and funding is available.
	Forest System Trails	• Harvesting activities would avoid forest system trails, if possible. If it is determined necessary that a trail must be used as a temporary road or skid trail, then the trail would be restored to USFS standards post-treatment. • It is acceptable to make perpendicular trail crossings. Trail crossing locations would be designated and flagged with input from the District Trails Coordinator or assigned personnel. Trail crossings would be restored to pre-project condition after use. • Forest restoration treatments within close proximity (i.e. 100'-200') of forest system trails would consider "feathering" the treatment so the visual impacts are more transitional than abrupt and as to not significantly change the character or experience of the trail.
	Special-Use Events	Coordinated efforts would be made with sponsors of recreational special-use events (i.e. running or mountain biking races) to minimize the impacts of such proceedings within the project area

		during forest restoration activities.
	High-Use Weekends and Holidays	Efforts would be taken to limit forest treatment activities within the project area during high-use weekends and holidays (i.e. Memorial Day, 4th of July, Labor Day, etc.); especially in locations where recreation based activities (i.e. trails, trailheads, etc.) occur.
	Mt. Elden Environmental Study Area	Measures would be taken to safeguard the trails and interpretive signs/markers within the Mt. Elden Environmental Study Area from forest restoration activities.
	Wilderness	• Improve the wilderness boundary signing where forest restoration operations are planned within close proximity (i.e. ¼ mi.) of a wilderness area. • Forest restoration treatments within close proximity (i.e. ¼ - ½ mile) to a wilderness area would consider "feathering" the treatment so the visual impacts are more transitional than abrupt.
Scenery	Edges of Individual Units	Thinning forest vegetation geometric shapes would be avoided when it does not interfere with implementation feasibility or safety, and high contrast would be avoided between treatment locations. Use the following techniques: • Shape and/or feather the edges of treatment areas to avoid abrupt changes between treated and untreated areas. • Where the treatment unit is adjacent to denser forest (treated or untreated), the percent of thinning within the transition zone (150-250 feet) would be progressively reduced toward the denser edges of the unit. • Similarly, where the treatment unit interfaces with an opening (including savannah and grassland treatments, and natural openings) the transition zone would progressively increase toward the open edges of the unit. • Soften edges by thinning adjacent to the existing unit boundaries. Treat up to the edges; do not leave a screen of trees. Favor groups of trees complying with the prescribed treatment that visually connect with the unit's edge to avoid an abrupt and noticeable change. • Treatment boundaries should extend up and over ridgelines to avoid the "Mohawk" look. • Avoid widely spaced individual trees that are silhouetted along the skylines.

	Unit Marking	• Avoid using trails as boundaries especially for different prescribed treatments. • Avoid abrupt changes between treatment units. Use the techniques suggested for edges of treatment units (above).
	Road, Skid Trail & Landing Construction	• Utilize existing skid roads and landings to the extent possible. • Log landings, temporary roads, and skid trails should be minimized within sensitive viewsheds such as those next to developed recreation sites, private homes or communities, paved and passenger car level roads and trails. • Log landings, skid trails and temporary roads would be rehabilitated including restoring proper drainage, and reseeding as needed with native species. • To hasten recovery and help eliminate unauthorized motorized and non-motorized use of skid trails and temporary roads, use physical measures such as re-contouring, pulling slash and rocks across the line, placing cull logs perpendicular to the route, and disguising entrances.
	Cull Logs, Stump Heights & Slash Treatments	• Cull logs would not be abandoned on landings. • Use cull logs for closing temporary roads and decommissioning roads. • Cull logs may also be suitable to use as down woody material, but must be scattered away from the landings. • Stump heights should be cut as low as possible. • Unless used for erosion control or maintenance of soil productivity, slash on log landings must be treated or removed. • In the seen area immediate foreground of sensitive places (within 300 feet of the centerline of paved or passenger car level roads or trails, or 300’ from the boundary of a recreation site or private land/communities): ○ Where whole tree logging occurs, machine piling may occur to the middle/back of log landings. Prioritize slash burning in these locations within one year or as soon as possible after treatment. • Root wads and other debris in sensitive foreground areas would be removed, buried, burned, or chipped. If materials are buried, locate in previously disturbed areas where possible, such as areas for road obliteration. Beyond sensitive immediate foreground areas,

		it is acceptable to scatter these or use them to help close temporary roads or skid trails. • Place project-generated slash outside of permitted utility line and pipeline rights-of-way; do not interfere with utility corridor management.
	Fire Control Lines	• Wherever possible, construct fire lines to reduce the contrast so that they are not noticeable in the middle and background views. • Generally restore control lines to a near undisturbed condition in the foregrounds (within 300 feet) of sensitive roads, trails, and developed recreation sites. • To hasten recovery and help eliminate unauthorized motorized and non-motorized use of control lines, use measures such as re-contouring, pulling slash and rocks across the line, and disguising entrances to system roads and trails.
Range	Infrastructure	• Protect range infrastructure from prescribed fire (e.g. by lining fence stays). • Upon completion of implementation, cattle guards would be cleaned to pre-implementation condition.
	Implementation	• Coordinate implementation activities with range specialists when implementation would impact an active grazing allotment. • Vehicles passing through grazing pastures would close gates upon entering and exiting the area to ensure livestock remain in the correct pasture.

Appendix B – Forest Plan Amendments

Three project specific, non-significant plan amendment are proposed for the proposed action. This amendment would apply to the Flagstaff Watershed Protection Project only, and would not apply to future projects on the Coconino National Forest. A site (project) specific plan amendment is a one-time variance in Forest Plan direction for the project; Forest Plan direction reverts back to its original language/direction upon completion of the specified project. The language proposed does not apply to any other forest project.

Amendment 1

The Coconino National Forest Plan (hereafter referred as "Forest Plan") directs projects to manage for uneven-aged stand conditions within goshawk habitat. More recent science has shown that historically more open spaces were present in the landscape and the importance of such open spaces (interspaces). Thus there is a need for a non-significant, project-level Forest Plan amendment to include: the definition of **interspaces** within northern goshawk habitat (both within and outside of PFAs); how interspaces and openings relate to **vegetative structural stage** (**VSS**) and how canopy cover would be measured in landscapes within and outside of PFAs. Forested groups consist of an interspersion of six vegetation structural stages (VSS 1 to VSS 6). For the purposes of this amendment, the following definitions apply:

- **Stand**: A stand is defined as a contiguous area of trees sufficiently uniform in forest type, composition, structure, and age class distribution, growing on a site of sufficiently uniform conditions to be a distinguishable unit. Four classification characteristics are generally used to distinguish forest stands: bio-physical site (soils, aspect, elevation, plant community association, climate, etc…), species composition, structure (density, and age (1-aged, 2-aged, uneven-aged)), and management emphasis (administrative requirements and local management emphasis that will shape structure over time). Based upon agency guidelines, the minimum stand mapping size is 10 acres.

- **Interspace:** The space between groups and clumps of trees (VSS 1-6) that are intended to be dominated by grass/forb/shrub vegetation and may include scattered individual trees.

Amendment 1 Description

In the "Vegetation Management - Landscapes Outside Goshawk Post-fledgling Family Areas" and "Vegetation Management -Within Post-fledgling Family Areas" section of the forest plan, a non-significant plan amendment would: (1) remove and/or replace references to using vertical crown projection to measure canopy cover with language specific to this analysis, (2) add the desired percentage of interspace within uneven-aged stands to facilitate restoration and define interspace, (3) add the interspace distance between tree groups, (4) add language clarifying where canopy cover is and is not measured, (5) provide minimum stocking guidelines to inform canopy cover at the group level as displayed in tables 1-2 and 1-3, and, (6) add language clarifying reserve trees are specific to created regeneration openings in Landscapes Outside Goshawk Post-fledgling Family Areas.

The amendment would not impose requirements on the Coconino NF's future management of goshawk habitat as the amendment is specific to this analysis. Because forest plan canopy cover requirements would be met in VSS 4 to 6 and movement towards balanced age classes would occur, the amendment is consistent with the management emphasis of achieving diverse and healthy stands.

Need for Plan Amendment

There is a need to define and describe interspace, clarify the relationship between interspace to the vegetation structural stage (VSS) classes, and describe how canopy cover would be measured in landscapes outside and within goshawk Post-fledgling Family Areas. This amendment does not include those acres proposed for grassland or meadow treatment which facilitate movement of some ponderosa pine acres towards an open reference condition, those acres of habitat where no treatments are proposed (goshawk nest stands), or acres where prescribed burn-only treatment is proposed. Northern goshawk standards and guidelines outlined in the CNF LMP apply to forested and woodland areas outside of MSO protected and restricted areas.

Amendment 2

Amendment 2 is a specific, one-time variance for managing MSO habitat in the FWPP project area. Once the project is complete, current Forest Plan direction would apply to the project area. The language proposed does not apply to any other forest project.

Amendment 2 Description

Amendment 2 would remove the treatment diameter limit of 9 inches dbh in six MSO PACs and 24 inches dbh in MSO restricted habitat within the project area, and allow mechanical thinning within PACs and restricted habitat to reduce the risk of high-severity wildfire. It would also allow thinning and prescribed burning treatments within MSO nest cores. The amendment would remove language referencing monitoring (pre- and post-treatment, population, and habitat); replacement language would defer to a monitoring plan developed by the Forest Service, U.S. Fish and Wildlife Service (FWS), and the Rocky Mountain Research Station specifically for this project. The monitoring plan would include the details for sample selection, treatment specifics, measurement protocols including timing, and planned analyses. The proposed monitoring plan would also pair treated and untreated (reference) PACs within the Dry Lake Hills and Mormon Mountain portions of the project and compare occupancy rates, reproduction rates, and habitat changes. Reference PACs would match the environmental conditions in PACs where treatments are proposed, as closely as possible. Amendment 2 would also remove timing restrictions on treatments within MSO PACs for the duration of the FWPP project implementation. Treatments would be prioritized to be accomplished within two years, and would be coordinated with FWS.

Need for Plan Amendment

MSO PAC field reviews, data evaluation, and vegetation simulation modeling indicate that there is a need to mechanically thin trees greater than 9 inches dbh in the six PACs and greater than 24 inches dbh in restricted habitat within the project boundary in order to facilitate treatments to achieve the purpose and need of the FWPP project: to reduce the risk of high-intensity wildfire and subsequent flooding.

There is a need to treat within MSO nest/cores to remove fuels and reduce the risk of ecologically-damaging wildfire as leaving these areas untreated would not meet the purpose and need, and could also hinder the feasibility of prescribed burning in PACs. Lining the core areas would be expensive in terms of time, money, and other resource commitments, and would still leave these areas vulnerable to high-intensity wildfire.

There is a need to replace the monitoring language specified in the Forest Plan in order to better incorporate a monitoring plan tiered to the revised MSO Recovery Plan (USFWS 2012) and developed by the Forest Service, the Fish and Wildlife Service, and the Rocky Mountain Research Station. Monitoring assesses the effectiveness of management actions and provides the adaptive framework needed to develop successful management by assisting in determining the effects of thinning and burning on Mexican spotted owls and their habitat. The monitoring plan will be reviewed as part of the consultation process for treatments planned to occur within PACs.

Amendment 3

Amendment 3 Description

Amendment 3 would remove language restricting mechanical equipment to slopes less than 40 percent and language identifying slopes above 40 percent as inoperable. This amendment would allow mechanical harvesting on slopes greater than 40 percent within the project area.

Need for Plan Amendment

It would be necessary to allow for use of specialized mechanical equipment to cut and remove trees on steep slopes to reduce the risk of high-severity wildfire in this project area due to the preponderance of areas with greater than 40 percent slope in the project area. Furthermore, since the Forest Plan was written and amended, mechanized ground-based equipment has progressed to be able to operate on steep slopes more effectively. While this specialized equipment is not commonplace in this region due to the high cost of its use, the approval of the City bond makes the use of such equipment a possibility for this project. In order to be able to utilize such equipment to treat slopes above 40 percent in the project area and meet the purpose and need, this Forest Plan amendment is needed.